EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

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COST Action CM1105

Functional metal complexes that bind to biomolecules

2012 | 2016

Objectives

- To develop and evaluate in a structure-targeted approach new metal-based compounds that exert their function as metallo-drugs, as research tools, or as diagnostic tools by binding to biomolecules, and to understand their modes of action.
- To promote the field of Medicinal Inorganic Chemistry by developing novel metal-based antibiotic, anticancer, or antiviral drugs for diagnostic and therapeutic applications.
- To consolidate the prominence of European research on metal-based drugs.
- To investigate the possibility of drugging specific targets, thereby opening up a way to more efficient probes and diagnostics that help clinicians to diagnose and decide on follow-up therapies.
- To develop new tools for fundamental research.
- To generate networking opportunities for ESRs.

Main Achievements

- Identification of molecular targets for organometallic compounds (integrins for RAPTA-T, redox enzymes for other ruthenium-based compounds).
- New insights into the interaction of metal complexes with protein targets (carbonic anhydrase II, PARP, aquaporins, thioredoxin reductase, Atox1).
- Identification of platinum(II) complexes that are highly luminescent when bound to DNA (potentially useful for cellular imaging).
- New patent on osmium compounds with anti-cancer activity obtained.
- High level of inter-disciplinarity achieved during the first year.
- High level of ESR participation (44%) in Action events.

Chemistry and Molecular Sciences and Technologies (CMST)

Participating countries

AT, CH, CZ, DE, DK, ES, FI, FR, GR, HR, HU, IE, IL, IS, IT, NL, PL, PT, RO, RS, SE, SI, TR, UK, Australia, New Zealand

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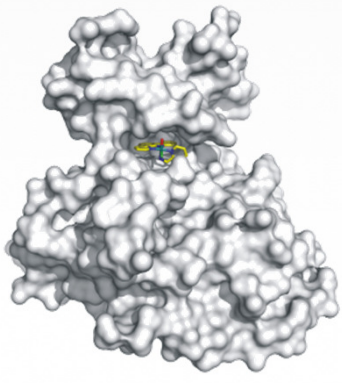

Representative illustration of a metal complex bound to a protein.

COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through a European Commission contract

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Working Group activities

WG 1: Protein targets

- 10 research groups, coordinator: Dr. Alberta Bergamo, Callerio Foundation, Italy.
- Joint WG meeting with WG 5 in Groningen (NL).

WG 2: Emerging nucleic acid targets (beyond the double helix)

- 14 research groups, coordinator: Prof. Dr. Eva Freisinger, Universität Zürich, Switzerland.
- WG meeting in Birmingham (UK).
- Co-organised a joint Summer School with COST Action CM1003 on "Chemistry of Metals in Biological Systems" in Louvain-la-Neuve.

WG 3: Metal bioconjugates for targeting and delivery

- 14 research groups, coordinator: Prof. Dr. Roger Alberto, Universität Zürich, Switzerland.
- WG meeting in Innsbruck (AT).
- Organised a Training School on "Solution equilibrium (speciation) studies on metal complexes" in Debrecen.

WG 4: Interactions of metallo-drugs on the cellular level

- 12 research groups, coordinator: Prof. Dr. Patrick Bednarski, Ernst-Moritz-Arndt-Universität Greifswald, Germany.
- WG meeting in Olomouc (CZ).

WG 5: Prodrugs with novel activation strategies

- 14 research groups, coordinator: Dr. Adoración Gómez Quiroga, Universidad Autónoma de Madrid, Spain.
- Joint WG meeting with WG 1 in Groningen (NL).

Industry participation

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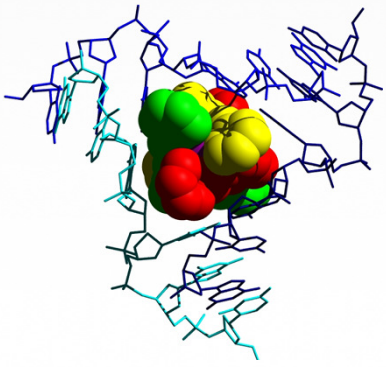

Representative illustration of a metal complex bound to a nucleic acid.

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